Contribution ID: **5** Type: **not specified**

Local metal-insulator transitions in VO2 thin films studied by 57Fe emission Mössbauer spectroscopy

Tuesday 16 July 2019 15:55 (10 minutes)

VO2 shares the similar metal-insulator transitions (MIT) and structural phase transition properties as the V2O3 and found equally important applications in Mott memory and neuromorphic devices, which surpass the limitations of conventional electronics. In contrast, MIT occurs at much higher temperature (340 K) in VO2 that that (160 K) in V2O3. Furthermore, the MIT of VO2 is much more robust and less susceptible to implantation-induced disorder than for V2O3. This indicates that the formation of the MIT and the structural-phase transition in VO2 are dominated by local properties, which is more suitable to be probed by the emission Mössbauer spectroscopy. Based on the results obtained from V2O3 in 2016 and 2017 beam times, we noticed that the V2O3 was prone to implantation damage, this limits the power of the emission Mössbauer spectroscopy to closely follow the MIT process. Although some measurements were done on the VO2 thin film samples in 2015, the results are not conclusive mostly due to the film quality. Here we propose to refocus on the application of emission Mössbauer spectroscopy to study the local-scale MIT phenomena in VO2 thin films with improved structural and stoichiometric quality.

Presenter: QI, Bingcui (University of Iceland (IS))

Session Classification: Oxides - Results